

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
21 November 2002 (21.11.2002)

PCT

(10) International Publication Number
WO 02/093639 A2

(51) International Patent Classification⁷: **H01L 21/66**

01099 Dresden (DE). **SCHDEL, Thorsten** [DE/DE]; Wilder Mann Str. 43, 01129 Dresden (DE). **MARX, Eckhard** [DE/DE]; Birkenweg 2, 01471 Radeburg (DE). **HRASCHAN, Günther** [AT/DE]; Darwinstr. 7a, 01109 Dresden (DE).

(21) International Application Number: PCT/EP02/05189

(22) International Filing Date: 10 May 2002 (10.05.2002)

(25) Filing Language: English

(74) Agent: **EPPING, HERMANN & FISCHER**; Ridlerstrasse 55, 80339 München (DE).

(26) Publication Language: English

(81) Designated States (*national*): JP, KR, SG, US.

(30) Priority Data:
01112140.7 17 May 2001 (17.05.2001) EP

(84) Designated States (*regional*): European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR).

(71) Applicant (*for all designated States except US*): **INFINEON TECHNOLOGIES AG** [DE/DE]; St.-Martin-Str. 53, 81669 München (DE).

Published:

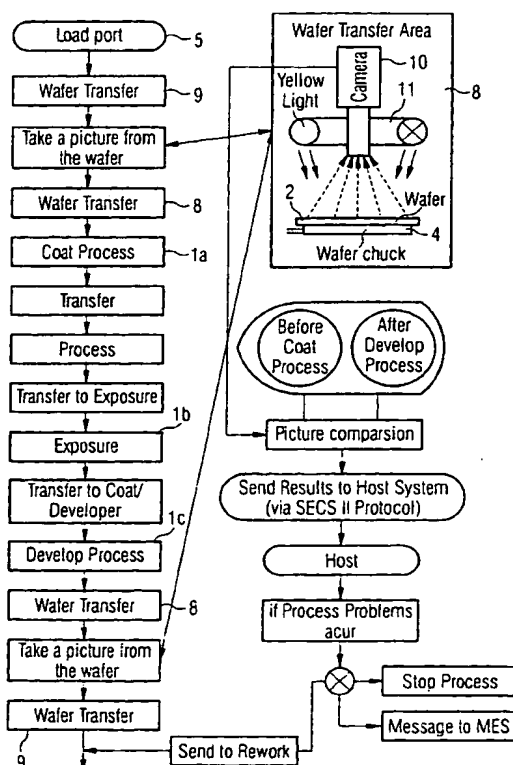
— without international search report and to be republished upon receipt of that report

(72) Inventors; and

(75) Inventors/Applicants (*for US only*): **SEIDEL, Torsten** [DE/DE]; Hüblerstr. 40, 01309 Dresden (DE). **OTTO, Ralf** [DE/DE]; Zu den Kleingärten 35, 01723 Kesselsdorf (DE). **SCHUMACHER, Karl** [DE/DE]; Stolpener Str. 3,

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: ARRANGEMENT AND METHOD FOR DETECTING DEFECTS ON A SUBSTRATE IN A PROCESSING TOOL



(57) Abstract: A processing tool (1) for manufacturing semiconductor devices (2), e.g. a lithography cluster, comprises a device transfer area (8) with an optical sensor (10), preferably a CCD-camera, and an illumination system (11) mounted within, such that a substrate (2) being transferred to or from one of its processing chambers (1a, 1b, 1c) can be scanned during its movement at low resolution. The substrate (2) may be either a semiconductor wafer to be manufactured or a reticle or mask used to perform an exposure on said wafer. The scanning is performed twice, prior and after processing in at least one the processing chambers (1a, 1b, 1c) of the processing tool (1). Both images are compared and optionally subtracted from each other. Defects imposed to the substrate due to contaminating particles only during the present processes with sizes larger than 10 µm are visible on the subtracted image, while defects imposed earlier are diminished as well as structures formed from e.g. a mask pattern below 10 µm. Pattern recognition allows an efficient classification of the defects being just detected in a processing tool (1). Thus, semiconductor device yield and metrology capacity are advantageously increased.

WO 02/093639 A2